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Impact of the South Korea-U.S. Free Trade Agreement on the U.S. Livestock Sector

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Fabiosa, Jacinto F.; Hayes, Dermot J.; and Dong, Fengxia, "Impact of the South Korea-U.S. Free Trade Agreement on the U.S. Livestock Sector" (2007). *CARD Working Papers*. 461.

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Using the Food and Agricultural Policy Research Institute's modeling system, we find that livestock prices increase by 0.5% to 3.8% under the agreement. And together with an expansion by 381 to 883 million pounds in meat exports, the value of U.S. exports increase by close to U.S.\$2 billion, or a 15.2% increase.

Because of differential baseline starting market shares and differential rates and staging specifications, the beef sector results are primarily driven by trade diversion impacts, while a combination of trade diversion and trade creation characterizes the results in pork and poultry sectors.

Keywords

dairy, free trade agreement, livestock, poultry, trade creation and diversion

Disciplines

Agricultural and Resource Economics | Agricultural Economics | Economic Policy | Industrial Organization | International Economics

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Working Paper 07-WP 455
November 2007

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Keywords: dairy, free trade agreement, livestock, poultry, trade creation and diversion.

1. Introduction

On June 30, 2007, Korea and the United States signed a free trade agreement—the KORUS FTA. The agreement is pending approval by the U.S. Congress. According to the United States Trade Representative (USTR), this will be the United States' most commercially significant FTA in 15 years. Korea is a trillion-dollar economy and is the United States' seventh-largest trading partner. In 2006, exports of U.S. goods to Korea were valued at \$32.5 billion, an increase of 16.9% from the previous year. The agreement is described in great detail at the USTR Web site (USTR, 2007); of particular relevance to this study is that “almost two-thirds of U.S. agricultural exports will be immediately duty-free when the KORUS FTA is implemented (\$1.91 billion duty free out of \$2.96 billion 2004-2006 average).”

The following products represent some of the key benefits for U.S. agriculture exporters:

- Immediate duty-free products include key commodities such as wheat, corn, soybeans for crushing, hides and skins, and cotton, plus a broad range of high-value processed and horticultural products, such as almonds, pistachios, bourbon whiskey, wine, raisins, grape juice, fresh cherries, frozen french fries, and frozen orange juice concentrate.
- For all beef products, Korea will eliminate its tariffs through a 15-year straight-line tariff phase out with a safeguard that begins growing from 270,000 metric tons (mt), a quantity that is 17% larger than our largest historical shipments. Korea's tariffs on beef products range up to 40%.
- For pork, all frozen and processed pork products will be duty-free in 2014. Fresh and chilled pork products will be phased out in 10 years and subject to a 10-year safeguard that is higher than historical trade and grows 6% annually.
- For poultry, tariffs on most poultry cuts including legs will be eliminated in 10 years. Tariffs on frozen breasts and wings will be eliminated in 12 years. Tariffs on egg and albumin products will be eliminated over 5 to 12 years.
- For dairy, Korea agreed to establish tariff-rate quotas (TRQs) that provide immediate duty-free access on double the current shipment volumes of U.S. dairy exports

The terms of this agreement are unusually aggressive in that the United States has never before managed to obtain a zero tariff, zero quota agreement with a densely populated Asian country that has a significant agricultural industry. Countries in the region have typically chosen to maintain some protections for their domestic livestock industry, recognizing that without some form of trade protection the domestic livestock sector would have trouble competing against duty-free imports.

The purpose of this report is to evaluate the likely impact of this FTA on the U.S. livestock sector. The report is limited to livestock in part because existing barriers are

much greater against livestock than they are against feed grains. The first section of this report describes the way we modeled the agreement within the existing modeling structure at the Food and Agricultural Policy Research Institute (FAPRI). We then present the main results. The final section summarizes the most important results.

2. Model

In this analysis of the KORUS FTA, we employed FAPRI models.¹ The FAPRI modeling system is a world econometric agricultural model that is multimarket, partial equilibrium, and non-spatial. The model is extensive in terms of both its geographic and commodity coverage. The system captures important interactions between livestock-poultry-dairy and the feed grains sector as well as the competing alternative uses of grains as food, feed, and fuel. The FAPRI model solves for world prices by equating excess supply and demand in the world market. The FAPRI model is driven by two major groups of exogenous shifters. First, the model incorporates forecasts of macroeconomic variables, such as gross domestic product, inflation rates, exchange rates, and population. Second, policy instruments are parameterized in the model. In the baseline, FAPRI assumes that all government programs and international agreements currently in effect will remain in place over the projection period. In particular, the market access, domestic support, and export competition reform commitments of contracting parties in the Uruguay Round Agreement on Agriculture (URAA) of the World Trade Organization are parameterized in the baseline (WTO, 2007). To conduct this analysis we ran a scenario in which the URAA policy parameters were replaced by the KORUS FTA. Tables 1 through 6 compare the trade regime parameters between the URAA and the KORUS FTA for beef, pork, poultry, powder milk, cheese, and butter. The impact of the KORUS FTA is estimated by comparing the results of the scenario run to the baseline numbers.

Analyzing the impact of a bilateral trade agreement using a non-spatial partial equilibrium model presents many challenges. In the case of the KORUS FTA, in which only the United States is given preferential treatment in trade, it is necessary to estimate, especially in the baseline, the U.S. share of in Korea's imports for the commodities of interest so the analysis can examine trade diversion and trade creation impacts. For this purpose, the U.S. baseline share in total world trade is applied as its share in South Korea as well. Using this assumption, the U.S. share of South Korea's beef import market increases from 0.21% in 2006 (USDA-FAS, 2007) to 36% in 2016. The very low share in the beginning reflects the restrictive import rules Korea adopted after BSE (bovine spongiform encephalopathy) cases were reported in the United States. In 2001, the United States reached its peak pre-BSE market share of 64%. In the case of pork, the U.S. market share increases from 52% to 65%, and in broiler the market share increases from 26% to 39%. The analysis proceeds by projecting that the United States captures all of South Korea's import market for the three meats because of the preferential treatment afforded by the FTA for all meat imports coming from the United States. For example, in

¹ Only the livestock and dairy models were used in this analysis. Impacts on the grain and oilseed sectors were not accounted for. The models were solved until 2016, but further liberalizations beyond 2016 are envisioned in the KORUS FTA.

beef, imports from the United States enter duty-free at a TRQ of 324 thousand metric tons (tmt) in 2016. Imports in excess of the TRQ are charged only 30% duty while other suppliers are charged 40% (see table 1). In 2022, all imports from the United States can enter duty-free. The differential is even higher in the case of pork, in which the United States has free access to the South Korean market, while other suppliers will still pay a duty of 22.5% to 25% (table 2). The same holds for poultry: U.S. imports enter duty-free while other suppliers pay 20% duty (table 3).

In dairy products, the United States supplied 13% of cheese, 0.42% of butter, and 13% of nonfat dry (NFD) milk imports to South Korea in 2005 (USDA-FAS, 2007). With the FTA, the United States can have free access to South Korean cheese and butter markets. By 2016, cheese imports within the TRQ enter duty-free, with out-quota imports charged 0% to 12% duty while other suppliers pay 36%. By 2021 all cheese imports from the United States enter duty-free (table 4). For butter, by 2016 U.S. imports enter duty-free while other suppliers pay 89% (table 5). Clearly, the FTA grants U.S. cheese and butter a very price competitive position in Korean markets. With more product differentiation in processed dairy products and demand for variety by consumers, the analysis assumes that the United States captures 80% and 90% of market share in South Korean cheese and butter import markets, respectively, over 10 years. As the over-quota tariffs on NFD will remain at the current most-favored nation (MFN) rates (table 6), the analysis assumes that in 10 years, the U.S. exports of NFD will continue to supply 13% of Korean NFD imports plus the duty-free quantity of 5,000 tons. In effect, the FTA allows the United States to gain market share from existing trade currently supplied by other countries and at the same time fully capture whatever trade is created as a result of the lower duties for imports coming from the United States under this agreement.

Although the world model is not formally solved into full equilibrium in the scenario run, it is assumed that the differential duties in South Korea provide enough of a price wedge between the United States and its competitor to cause reduced production and increased consumption in competing countries, bringing the world market back into equilibrium.

3. Results

The results in beef are primarily driven by trade diversion impacts. That is, the United States captures all market shares from existing trade, as its beef exports to South Korea are given a duty advantage of 10 percentage points over competing exports. As shown in table 7, total U.S. beef exports expand by 427 million pounds, an increase of 18.9%, while new trade created in South Korea is rather limited at 23 million pounds, representing only a 2.6% increase in beef imports. Part of the reason is that the impact on beef consumption in South Korea is muted because the beef price decline from the reduction in duty from 40% MFN to the 30% out-quota rate for the United States is slightly offset by the 4.3% increase in the world beef price (table 8). Moreover, the larger price declines in pork and poultry dampen the demand impact in beef. The additional exportable surplus of beef in the United States is supplied mostly by higher beef production, which increases by 1.3%, and 0.2% lower U.S. consumption.

In contrast, the pork and broiler results reflect the combined impact of both trade diversion and creation. There is a larger reduction in duties for both pork and broiler. In the case of pork, from a 22.5% to 25% MFN duty, the U.S. gains duty-free access to South Korea's market. The FTA leads to an 11.3% decline in pork production and a 9.0% increase in pork consumption in South Korea. As a result, pork imports jump by 82.9%. As the FTA expands, and given the export demand faced by U.S. producers, the U.S. pork price increases by 3.7% (table 8), allowing the United States to expand exportable surplus to 883 million pounds—an increase of 21.3%—from a 3.2% increase in production and a 0.2% decline in consumption.

The same holds for the case of broiler, for which the MFN duty is 20% and the FTA allows duty-free entry of broiler imports from the United States. This lowers South Korea's broiler production by 11.8% while consumption expands by 6.1%, leading to a 148.0% increase in broiler imports, from 187 to 278 million pounds. Relative to the other three meats, the impact in the U.S. broiler sector is modest, with the price rising by only 0.5% (table 8), production increasing by 0.8%, consumption declining by 0.2%, and exports expanding by 5.6%.

The FTA leads to a 47.3% decline in Korean cheese production and a 13.1% increase in consumption (table 9). Consequently, Korean cheese imports increase by 45.3%. The preferential trade agreement makes the United States the dominant cheese exporter in the South Korean cheese market; U.S. cheese exports increase by 75.1%. The extra export demand prompts the U.S. domestic price to increase by 1.1% (table 8), and, consequently, domestic production grows by 0.5% and domestic consumption decreases by 0.7%.

U.S. butter exports to Korea also benefit greatly from the FTA. The market share increases to 90% from a negligible proportion. With a decline in the domestic price, Korean butter production decreases by 14.1% and consumption increases by 13.6% (table 9). As a result, U.S. butter exports to Korea increase from 11 to 35 million pounds, a growth of roughly 3.2 times. The jump in butter exports pushes up the U.S. butter price by 8.4% (table 9), which makes U.S. butter production increase by 1.94% and consumption decrease by 0.9%.

As butter and NFD are often jointly produced, the increase in butter production also leads to an increase in NFD production, and this actually exceeds the increase in export induced by the KORUS FTA. Consequently, the NFD domestic price decreases by 5.0% (table 8) and consumption increases by 1.9% (table 9). The effect of the KORUS FTA on U.S. NFD export expansion is relatively limited, comparable to the effects on cheese and butter, as the over-quota tariff still remains at the current MFN rates. The gain of US NFD exports is mainly from the increase in the duty-free quantity. U.S. NFD exports to Korea increase slightly, by 2.1%.

Higher prices for cheese and butter result in a modest increase, roughly 1%, in the U.S. milk price.

The total value of livestock, poultry, and dairy trade increases by U.S.\$1.9 billion, representing an increase of 15.2%. The larger share of this value is contributed by the livestock sector, which increases by U.S.\$1.87 billion, or 16.3%.

4. Conclusions

South Korea is a wealthy, densely populated Asian country with almost no feed grain production. It has managed to maintain a significant livestock industry by protecting the domestic industry from competition. The terms of the recently signed KORUS FTA gradually remove all of these protections. This agreement would also provide the U.S. livestock industry with preferential access to this enormous market. Cross-sectoral benefits are greatest for the pork sector. However, the U.S. beef sector does surprisingly well given the low level of existing exports. Our results suggest that by 2016 of this agreement U.S. livestock and dairy sector exports will have expanded by 15.2%, an increase of close to \$2 billion. U.S. livestock production expands to meet this new opportunity, and this expanded production mutes the long-run price impacts.

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Table 1. Beef muscle meat (201.10 to 201.30 and 202.10 to 202.30)

	URAA	KORUS FTA		
Year	Bound Rate	Out-quota	In-quota	TRQ
	Percent			tmt
1995	44.5			
2001	40.0			
2006	40.0			
2007	40.0	40.0	0.0	270.0
2008	40.0	40.0	0.0	276.0
2009	40.0	40.0	0.0	282.0
2010	40.0	40.0	0.0	288.0
2011	40.0	40.0	0.0	294.0
2012	40.0	30.0	0.0	300.0
2013	40.0	30.0	0.0	306.0
2014	40.0	30.0	0.0	312.0
2015	40.0	30.0	0.0	318.0
2016	40.0	30.0	0.0	324.0
2017	40.0	24.0	0.0	330.0
2018	40.0	24.0	0.0	336.0
2019	40.0	24.0	0.0	342.0
2020	40.0	24.0	0.0	348.0
2021	40.0	24.0	0.0	354.0
2022	40.0	0.0	0.0	

Table 2. Pork fresh-chilled and frozen (202.1 to 202.2) muscle meat

	.11 to .12		.21, .22, .291, .2999		.191 to .199		
	URAA		URAA		KORUS FTA		
	Bound	FTA	Bound	FTA	Out	In	TRQ
Year	Percent						tmt
1995	29.6		37.0				
2004	22.5		25.0				
2006	22.5	22.5	25.0	25		22.5	
2007	22.5	19.7	25.0	21.9	22.5	20.3	8.3
2008	22.5	16.9	25.0	18.8	22.5	18.0	8.7
2009	22.5	14.1	25.0	15.6	22.5	15.8	9.3
2010	22.5	11.3	25.0	12.5	22.5	13.5	9.8
2011	22.5	8.4	25.0	9.4	22.5	11.3	10.4
2012	22.5	5.6	25.0	6.3	15.8	9.0	11.0
2013	22.5	2.8	25.0	3.1	14.6	6.8	11.7
2014	22.5	0.0	25.0	0.0	13.5	4.5	12.4
2015	22.5	0.0	25.0	0.0	12.4	2.3	13.1
2016	22.5	0.0	25.0	0.0	11.3	0.0	13.9
2017	22.5	0.0	25.0	0.0	0.0	0.0	

Table 3. Poultry frozen cut muscle meat (207)

		KORUS FTA	
	URAA	.4101	.4102, .4103
	Percent		
1995	35.0		
1997	20.0		
2006	20.0	20.0	20.0
2007	20.0	18.0	18.3
2008	20.0	16.0	16.7
2009	20.0	14.0	15.0
2010	20.0	12.0	13.3
2011	20.0	10.0	11.7
2012	20.0	8.0	10.0
2013	20.0	6.0	8.3
2014	20.0	4.0	6.7
2015	20.0	2.0	5.0
2016	20.0	0.0	3.3
2017	20.0	0.0	1.7
2018	20.0	0.0	0.0

Table 4. Cheese (406)

		KORUS FTA			
		Out-Quota			
	URAA	.1 to .9	.9	In-Quota	TRQ
Year	Percent				tmt
1995	40.0				
1995	36.0				
2006	36.0				
2007	36.0	33.6	32.4	0.0	7.0
2008	36.0	31.2	28.8	0.0	7.2
2009	36.0	28.8	25.2	0.0	7.4
2010	36.0	26.4	21.6	0.0	7.6
2011	36.0	24.0	18.0	0.0	7.9
2012	36.0	21.6	14.4	0.0	8.1
2013	36.0	19.2	10.8	0.0	8.4
2014	36.0	16.8	7.2	0.0	8.6
2015	36.0	14.4	3.6	0.0	8.9
2016	36.0	12.0	0.0	0.0	9.1
2017	36.0	9.6	0.0	0.0	9.4
2018	36.0	7.2	0.0	0.0	9.7
2019	36.0	4.8	0.0	0.0	10.0
2020	36.0	2.4	0.0	0.0	10.3
2021	36.0	0.0	0.0	0.0	

Table 5. Butter (402)

	URAA	KORUS FTA		
Year	Bound Rate	Out-quota	In-quota	TRQ
		Percent		tmt
1995	99.0			
1996	89.0			
2006	89.0			
2007	89.0	80.1	0.0	0.20
2008	89.0	71.2	0.0	0.21
2009	89.0	62.3	0.0	0.21
2010	89.0	53.4	0.0	0.22
2011	89.0	44.5	0.0	0.23
2012	89.0	35.6	0.0	0.23
2013	89.0	26.7	0.0	0.24
2014	89.0	17.8	0.0	0.25
2015	89.0	8.9	0.0	0.25
2016	89.0	0.0	0.0	

Table 6. Powder and evaporated milk (402)

	KORUS FTA			
	Out-Quota			
	URAA			
	.10101, 21100	.911, .991	In-Quota	TRQ
Year	Percent			tmt
1995	200.0			
1995	176.0	99.0		
1996	176.0	89.0		
2006	176.0	89.0		
2007	176.0	89.0	0.0	5.0
2008	176.0	89.0	0.0	5.2
2009	176.0	89.0	0.0	5.3
2010	176.0	89.0	0.0	5.5
2011	176.0	89.0	0.0	5.6
2012	176.0	89.0	0.0	5.8
2013	176.0	89.0	0.0	6.0
2014	176.0	89.0	0.0	6.1
2015	176.0	89.0	0.0	6.3
2016	176.0	89.0	0.0	6.5
2017	176.0	89.0	0.0	6.7
2018	176.0	89.0	0.0	6.9
2019	176.0	89.0	0.0	7.1
2020	176.0	89.0	0.0	7.3
2021	176.0	89.0	0.0	7.6
2022	176.0	89.0	0.0	7.8

Table 7. Impacts of the U.S.-South Korea Free Trade Agreement on livestock

	United States			South Korea		
		Impact			Impact	
	Baseline	Change	Percent	Baseline	Change	Percent
	Million pounds			Million pounds		
Beef						
Production	28,292	363	1.28	639	-20	-3.20
Consumption	29,896	-50	-0.17	1,530	2	0.15
Exports	2,249	427	18.97			
Imports				891	23	2.55
Pork						
Production	22,915	725	3.16	2,794	-316	-11.30
Consumption	19,935	-42	-0.21	3,532	319	9.04
Exports	4,139	883	21.32			
Imports				767	636	82.99
Poultry						
Production	41,372	315	0.76	1,490	-176	-11.79
Consumption	34,160	-68	-0.20	1,671	102	6.10
Exports	6,820	381	5.59			
Imports				187	278	148.07

Table 8. Impacts of the South Korea-U.S. Free Trade Agreement on prices

	Baseline	Delta	Percent
	USD per cwt		
Livestock			
Beef	87.80	3.77	4.29
Pork	51.70	1.91	3.70
Poultry	73.17	0.50	0.68
Dairy			
Other Cheese	140.91	1.60	1.14
Butter	139.57	11.69	8.38
NFD	111.11	-5.59	-5.03

Table 9. Impacts of the South Korea-U.S. Free Trade Agreement on dairy

	United States			South Korea		
		Change			Change	
	Baseline	Delta	Percent	Baseline	Delta	Percent
	Million pounds			Million pounds		
Cheese						
Production	11,342	55.62	0.49	67	-31.92	-47.33
Consumption	11,608	-75.88	-0.65	194	25.39	13.09
Exports	174.00	130.62	75.07			
Imports				127	57.30	45.29
Butter						
Production	1,417	27.5	1.94	121	-17	-14.07
Consumption	1,468	-13.48	-0.92	131	17.84	13.58
Exports	12	40.82	340.20			
Imports				11	34.84	329.69
NFD						
Production	2,037	40.82	2.00	68	-29.24	-42.78
Consumption	1,165	22.34	1.92	72	0	0
Exports	873	18.11	2.07			
Imports				4	29.24	717.80

Table 10. Impacts of the South Korea-U.S. Free Trade Agreement on value of trade

	Baseline	Delta	Percent
	Million USD		
Livestock			
Beef	3,445	800	23.23
Pork	3,096	759	24.50
Poultry	4,991	315	6.31
Sub-total	11,532	1,874	16.25
Dairy			
Butter	17	63	378.66
Other Cheese	6	4	76.58
NFD	970	-35	-3.66
Sub-total	993	32	3.26
Grand Total	12,525	1,906	15.22